RESPONSE UNDER 37 C.F.R. § 1.116
EXPEDITED PROCEDURE
GROUP ART UNIT 2628

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application. No: 10/715,899	§	Examiner: Nguyen, Phu K.
Filed: November 18, 2003	§	Group/Art Unit: 2628
Inventor(s):	§	Atty. Dkt. No: 5181-09612
Michael F. Deering	§	
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Title: GRAPHICS SYSTEM HAVING A VARIABLE DENSITY SUPER-SAMPLED SAMPLE BUFFER	§	
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REQUEST FOR PRE-APPEAL BRIEF REVIEW

Mail Stop AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request. This request is being filed with a Notice of Appeal. The review is requested for the reason(s) stated below.

Applicant is in receipt of the Final Office Action mailed June 2, 2006. Claims 1-15, 24-29, and 33 remain pending in the present case. Reconsideration of the present case is earnestly requested in light of the following remarks. Please note that for brevity, only the primary arguments directed to the independent claims 1, 24, 26, and 33 are presented,

and that additional arguments, e.g., directed to the subject matter of the dependent claims, will be presented if and when the case proceeds to Appeal.

Claims 1-15, 24-29, and 33 were rejected under 35 U.S.C. 103(a) as being unpatentable over Foran et al. (USPN 6,072,500; hereinafter referred to simply as Foran) in view of Lin et al. ("A Parallel Rendering Approach to the Adaptive Supersampling Method"; hereinafter referred to simply as Lin).

Claim 1 recites:

A graphics system comprising:
a graphics processor configured to render a plurality of samples for an image, wherein said image is subdivided into a plurality of regions, and wherein a density of samples per pixel for at least one of the plurality of regions is different from a density of samples per pixel for at least one other of the plurality of regions;
a sample buffer coupled to said graphics processor for storing the plurality of samples; and
a sample-to-pixel calculation unit coupled to said sample buffer, wherein said sample-to-pixel calculation unit is configured to filter samples from the sample buffer to form output pixels.

Foran and Lin, either singly or in combination, do not teach or render obvious at least the following features of claim 1:

"to render a plurality of samples for an image, wherein said image is subdivided into a plurality of regions, and wherein a density of samples per pixel for at least one of the plurality of regions is different from a density of samples per pixel for at least one other of the plurality of regions".

The Examiner states at page 2 of the current Office Action that "Foran <u>does not teach</u> "pixels are rendered with a variable density of samples, wherein the <u>density varies by region</u>"" [emphasis added].

The Examiner also states that "Lin teaches that such "variable density of samples per pixel, wherein the density varies by region" is well known in the art". However, what Lin describes on pages 513 and 514 is sample density varying **<u>within</u>** a region. Lin does

not teach "wherein a density of samples per pixel for at least one of the plurality of regions is **different** from a density of samples per pixel for at least one other of the plurality of regions".

> Lin first teaches subdivided screen **regions** at page 513, Section 3.1:
> "Screen subdivision scheme is one of the data-decomposition methods by which data are divided according [to] their geometric description of the scene. In most cases, processors are assigned to handle a group of subdivided screen regions, geometry primitives are transferred to the corresponding processor to do rasterization."
>
> Lin teaches the size of the screen regions at page 514, lines 6-12:
> "The image size we use in testing is 512x512 pixels with 24 bits per pixel. We have constructed several data files to test our algorithm and load distribution among processors. For the data file that contains 4000 polygons randomly distributed on the screen. The size of each polygon is 50 pixels. Figure 7a shows the output of the data file and figure 3 presents the completion time and the average idle time of processors when we divide the screen into 64 tiles with 64x64 pixels in each region and assign them to 8 processors".

In this example, Lin describes a **region with 4096 pixels and approximately 82 polygons**.

Lin describes a sample density greater than one at polygon edges and a sample density of one for any pixel not intersecting a polygon edge at page 512, lines 21-23:

> "…when scan converting a **polygon**, if the polygon covers the whole pixel, we sample the pixel only once. If the polygon partially covers the pixel, we perform a supersampling of that pixel."

However, Lin's descriptions are limited to sample density varying within a region of the image. Lin does not teach "wherein a density of samples per pixel for at least one

of the plurality of regions is **different** from a density of samples per pixel for at least one other of the plurality of regions".

In addition, Lin's description of polygon edge dependent sample density varying within a region of the image is not at all the same as Applicant's use of "different regions of the display device may be allocated different sample densities" as described at least at page 32, lines 5-14 of Applicant's specification:

> "If the graphics system implements variable resolution super sampling, then the **triangles** are **compared** with the **sample density region boundaries** (step 208B). In variable-resolution super-sampled sample buffer implementations, **different regions** of the display device may be **allocated different sample densities** based upon a number of factors (e.g., the center of the attention on the screen as determined by eye or head tracking). Sample density regions are described in greater detail below (see section entitled Variable Resolution Sample buffer below). If the **triangle crosses a region boundary** (step 210), then the **triangle may be divided into two smaller polygons along the region boundary** (step 212). This may allow **each newly formed triangle** to have a **single sample density**.

Applicant submits that independent claim 1 is non-obvious and patentably distinguished over Foran and Lin for at least the reasons given above. Applicant further submits that the independent claims 24, 26, and 33 are also non-obvious and patentably distinguished over Foran and Lin for at least the reasons given above in support of claim 1.

CONCLUSION

In light of the foregoing amendments and remarks, Applicant submits the application is now in condition for allowance, and an early notice to that effect is requested.

If any extensions of time (under 37 C.F.R. § 1.136) are necessary to prevent the above referenced application(s) from becoming abandoned, Applicant(s) hereby petition for such extensions. If any fees are due, the Commissioner is authorized to charge said fees to Meyertons, Hood, Kivlin, Kowert & Goetzel PC Deposit Account No. 50-1505/5181-09612/JCH.

Also filed herewith are the following item(s):

☒ Notice of Appeal

Respectfully submitted,

/Jeffrey C. Hood/

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Date: September 5, 2006 JCH/JWC